CLAIMS

What is claimed is:

1. A method for managing a mutex in a data processing system, the method comprising:

maintaining an average acquisition cost value for a mutex;

attempting to acquire the mutex by a first thread; and

in response to a determination that the mutex has already been acquired by a second thread, determining to enter a spin state or a sleep state on the first thread based on the average acquisition cost value for the mutex.

2. The method of claim 1 wherein the average acquisition cost value indicates an average consumption of computational resources by threads in acquiring the mutex.

3. The method of claim 1 further comprising:

maintaining a thread-specific current acquisition cost value that represents a consumption of computational resources by the first thread after an initial attempt to acquire the mutex and prior to acquiring the mutex; and

in response to the first thread acquiring the mutex, recomputing the average acquisition cost value for the mutex to include the thread-specific current acquisition cost value.

4. The method of claim 1 further comprising:

entering a spin state if the average acquisition cost value satisfies a first condition; and

entering a sleep state if the average acquisition cost value satisfies a second condition.

5. The method of claim 4 wherein the first condition is that the average acquisition cost value is less than a threshold value, and wherein the second condition is that the average acquisition cost value is greater than or equal to a threshold value.

6. The method of claim 5 wherein the threshold value is related to an amount of time that is required by a thread to enter and then exit a sleep state.

7. The method of claim 1 further comprising:

entering a spin state or a sleep state on the first thread; and

after exiting the spin state or the sleep state on the first thread, computing or retrieving a cost value that indicates a consumption of computational resources by the first thread during the spin state or the sleep state.

8. The method of claim 7 further comprising:

entering a spin state on the first thread by executing a busy-wait loop; and

computing the cost value that indicates a consumption of computational resources by the first thread during the spin state based on a number of iterations that are executed within the busy-wait loop.

9. The method of claim 7 further comprising:

entering a sleep state on the first thread by executing a system call to suspend execution of the first thread; and

computing the cost value that indicates a consumption of computational resources by the first thread during the sleep state based on an amount of time that the first thread is in the sleep state.

10. The method of claim 7 further comprising:

adding the cost value that indicates a consumption of computational resources by the first thread during the spin state or the sleep state to a current acquisition cost value that represents a consumption of computational resources by the first thread after an initial attempt to acquire the mutex and prior to acquiring the mutex.

11. The method of claim 7 further comprising:

normalizing the cost value that indicates a consumption of computational resources by the first thread during the spin state or the sleep state prior to adding it to the current acquisition cost value.

12. An apparatus for managing a mutex in a data processing system, the apparatus comprising:

means for maintaining an average acquisition cost value for a mutex;

means for attempting to acquire the mutex by a first thread; and

means for determining to enter a spin state or a sleep state on the first thread based on the average acquisition cost value for the mutex in response to a determination that the mutex has already been acquired by a second thread.

13. The apparatus of claim 12 wherein the average acquisition cost value indicates an average consumption of computational resources by threads in acquiring the mutex.

14. The apparatus of claim 12 further comprising:

means for maintaining a thread-specific current acquisition cost value that represents a consumption of computational resources by the first thread after an initial attempt to acquire the mutex and prior to acquiring the mutex; and

means for recomputing the average acquisition cost value for the mutex to include the thread-specific current acquisition cost value in response to the first thread acquiring the mutex.

15. The apparatus of claim 12 further comprising:

means for entering a spin state if the average acquisition cost value satisfies a first condition; and

means for entering a sleep state if the average acquisition cost value satisfies a second condition.

16. The apparatus of claim 15 wherein the first condition is that the average acquisition cost value is less than a threshold value, and wherein the second condition is that the average acquisition cost value is greater than or equal to a threshold value.

17. The apparatus of claim 16 wherein the threshold value is related to an amount of time that is required by a thread to enter and then exit a sleep state.

18. The apparatus of claim 12 further comprising:

means for entering a spin state or a sleep state on the first thread; and

means for computing or retrieving a cost value that indicates a consumption of computational resources by the first thread during the spin state or the sleep state after exiting the spin state or the sleep state on the first thread.

19. The apparatus of claim 18 further comprising:

means for entering a spin state on the first thread by executing a busy-wait loop; and

means for computing the cost value that indicates a consumption of computational resources by the first thread during the spin state based on a number of iterations that are executed within the busy-wait loop.

20. The apparatus of claim 18 further comprising:

means for entering a sleep state on the first thread by executing a system call to suspend execution of the first thread; and

means for computing the cost value that indicates a consumption of computational resources by the first thread during the sleep state based on an amount of time that the first thread is in the sleep state.

21. The apparatus of claim 18 further comprising:

means for adding the cost value that indicates a consumption of computational resources by the first thread during the spin state or the sleep state to a current acquisition cost value that represents a consumption of computational resources by the first thread after an initial attempt to acquire the mutex and prior to acquiring the mutex.

22. The apparatus of claim 18 further comprising:

means for normalizing the cost value that indicates a consumption of computational resources by the first thread during the spin state or the sleep state prior to adding it to the current acquisition cost value.

23. A computer program product on a computer readable medium for use in a data processing system for managing a mutex, the computer program product comprising:

means for maintaining an average acquisition cost value for a mutex;

means for attempting to acquire the mutex by a first thread; and

means for determining to enter a spin state or a sleep state on the first thread based on the average acquisition cost value for the mutex in response to a determination that the mutex has already been acquired by a second thread.

24. The computer program product of claim 23 wherein the average acquisition cost value indicates an average consumption of computational resources by threads in acquiring the mutex.

25. The computer program product of claim 23 further comprising:

means for maintaining a thread-specific current acquisition cost value that represents a consumption of computational resources by the first thread after an initial attempt to acquire the mutex and prior to acquiring the mutex; and

means for recomputing the average acquisition cost value for the mutex to include the thread-specific current acquisition cost value in response to the first thread acquiring the mutex.

26. The computer program product of claim 23 further comprising:

means for entering a spin state if the average acquisition cost value satisfies a first condition; and

means for entering a sleep state if the average acquisition cost value satisfies a second condition.

27. The computer program product of claim 26 wherein the first condition is that the average acquisition cost value is less than a threshold value, and wherein the second condition is that the average acquisition cost value is greater than or equal to a threshold value.

28. The computer program product of claim 27 wherein the threshold value is related to an amount of time that is required by a thread to enter and then exit a sleep state.

29. The computer program product of claim 23 further comprising:

means for entering a spin state or a sleep state on the first thread; and

means for computing or retrieving a cost value that indicates a consumption of computational resources by the first thread during the spin state or the sleep state after exiting the spin state or the sleep state on the first thread.

30. The computer program product of claim 29 further comprising:

means for entering a spin state on the first thread by executing a busy-wait loop; and

means for computing the cost value that indicates a consumption of computational resources by the first thread during the spin state based on a number of iterations that are executed within the busy-wait loop.

31. The computer program product of claim 29 further comprising:

means for entering a sleep state on the first thread by executing a system call to suspend execution of the first thread; and

means for computing the cost value that indicates a consumption of computational resources by the first thread during the sleep state based on an amount of time that the first thread is in the sleep state.

32. The computer program product of claim 29 further comprising:

means for adding the cost value that indicates a consumption of computational resources by the first thread during the spin state or the sleep state to a current acquisition cost value that represents a consumption of computational resources by the first thread after an initial attempt to acquire the mutex and prior to acquiring the mutex.

33. The computer program product of claim 29 further comprising:

means for normalizing the cost value that indicates a consumption of computational resources by the first thread during the spin state or the sleep state prior to adding it to the current acquisition cost value.